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PARASITES OF MANTIDÆ FROM NEW CALEDONIA

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The orthopteroid insects of New Caledonia (including the Loyalty Islands) show, in general, a very high degree of endemism, as might be expected from the long isolation of the island and its remarkable flora. Thus, J. Carl, reporting on the Phasmidæ, had to establish four new genera, and seventeen species appear to be confined to New Caledonia. Chopard, in his account of the Gryllidæ, describes ten new species out of twenty-one, and proposes two new genera. The Mantidæ are known from palæontological evidence to be of enormous antiquity, so it might be supposed that they also would be numerous and diversified in New Caledonia, especially since they abound in Australia and New Guinea. As the records stand, however, there seems to be only one species, *Poly-spilota* (?) *brunneriana* Saussure, 1871.

Dr. Jean Risbec, well known for his important studies of Mollusca, collected in September, 1929, a number of mantid egg-cases at Noumea, New Caledonia. The cases are attached to twigs in the usual manner; they are pale gray, quite soft, broad oval to subglobose, the larger ones about 31 mm. long and 23 mm. across. From these were bred numerous specimens, including three species, of the peculiar chalcidoids constituting the subfamily Podagrioninæ, which infest only the egg-cases of Mantidæ. These highly specialized parasites, spread over the globe whenever Mantidæ occur, must also be of great antiquity, though we know nothing of their actual history.

Ashmead (1904) recognized two genera: the wide-spread *Podagrion*, and the comparatively little-known *Pachytomus*, based by Westwood on a species from Egypt. The latter is given in Dalla Torre's 'Catalogue' as a subgenus, but it appears to be a valid genus, and I believe I am correct in referring one of the New Caledonia species to it. More recently, Girault has founded three additional genera on species from Australia. One of these, *Pachytomoides*, lacks the ring-joint of the antennæ, has the club enlarged, and the ovipositor very long. It includes three species from Queensland: two described by Masi from Formosa, and *P. greeni* (Crawford) from Ceylon. It is quite distinct from the New Caledonia species, all of which have the ring-joint.

A second genus, *Podagrionella*, contains four Australian species, and is usually recognizable by the dark markings of the wings, which are absent in all the New Caledonia forms. The third, *Pachystomoidella*, based on *P. magniclavus* Girault from Queensland, has the female antennal club enlarged and the four distal funicle joints transverse. The ovipositor is not quite as long as the body, the wings are hyaline, and the hind femora have seven large teeth. *Podagrion abbreviatum*, described below, might well be referred to *Pachystomoidella*, but I doubt the validity of the genus. Crawford seems to have been of a similar opinion when he described his *Podagrion crassiclava*, a species nearly agreeing with *Pachystomoidella*.

The known species of *Podagrion* come from Europe (five), tropical Africa (one), Seychelles Islands (one), Bourbon (one), Mauritius (one), Ceylon (three), China (three), Formosa (eight), Philippine Islands (two), Japan (one), Australia (thirteen), the United States (two), and the Neotropical Region (ten). The greatest concentration of species in a small area is in Formosa. In the case of the species credited to Europe, two are really of doubtful origin, being described by Dalman without precise indication of the locality. It seems remarkable to get three quite distinct species out of one lot of egg-cases in New Caledonia. The types of these are in The American Museum of Natural History.

PODAGRION Spinola

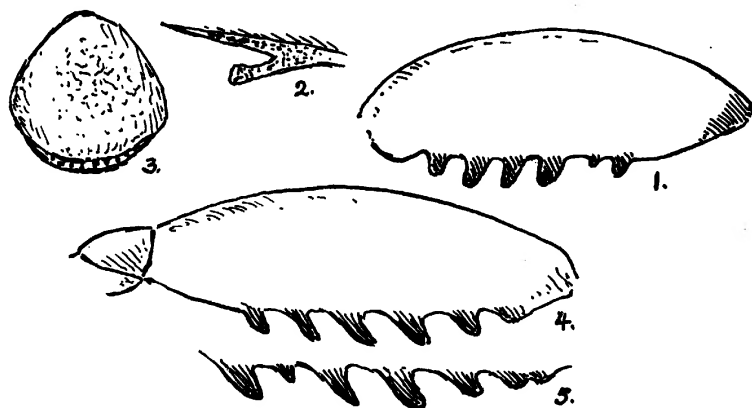
Podagrion dolichurum, new species

FEMALE (type).—Head and thorax about 1.5 mm., abdomen about 1.2 mm.; ovipositor about 6.5 mm.; face emerald-green; head and thorax above dull olive-green, scutellum shining golden-green, contrasting; metathorax dorsally bluish green; sides of thorax dull blue-green, shining golden-green above middle and hind legs; antennæ long, black; wings hyaline, venation dark; legs green, with the anterior knees, tibiæ and tarsi rufotestaceous, with the tibiæ largely dusky; middle tibiæ and tarsi very long and slender, similarly colored but rather darker; hind coxæ green, but apex and trochanters red; hind femora shining green with coppery tints, the teeth black; hind tibiæ dark, but tarsi red; abdomen shining green, coppery apically, the sides of venter rufofulvous.

Sculpture ordinary; surface of scutellum finely reticulated; metathorax with lateral carinæ but no spines; antennæ appearing 11-jointed, the club solid, slender, not enlarged, ring-joint present; hind tibiæ without angular projection on inner side; hind tarsi slender, femora with six teeth, the last sometimes double, and if not, short and broad; stigmal vein fairly long, appreciably broadened at apex.

MALE.—Length about 3 mm.; antennæ entirely black, rather stout, hairy; similar to female except for sexual characters, the abdomen ferruginous beneath near base, but otherwise entirely metallic, coppery at apex.

Three females and one male.

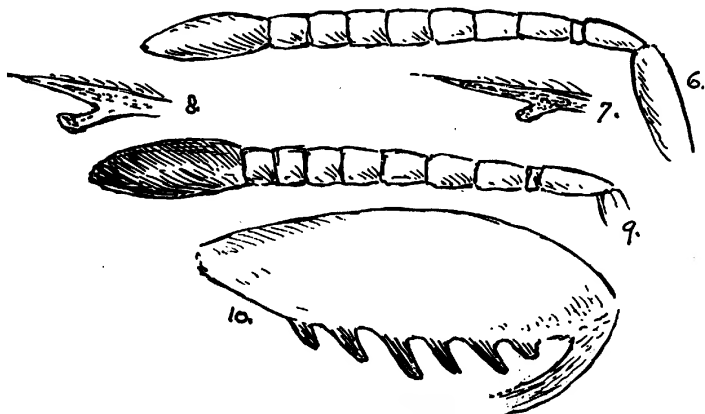
Figs. 1 to 5. *Podagrion dolichurum*.

1. Hind femur of male. 2. Stigmatic region of female. 3. Scutellum of female. 4. Hind femur of female. 5. Variation of hind femur of female.

The very long ovipositor is the most distinctive character. In the Australian *P. koebelei* Crawford, the ovipositor is even longer (8 mm.), but that is a much larger insect throughout, and the antennæ are quite different.

***Podagrion abbreviatum*, new species**

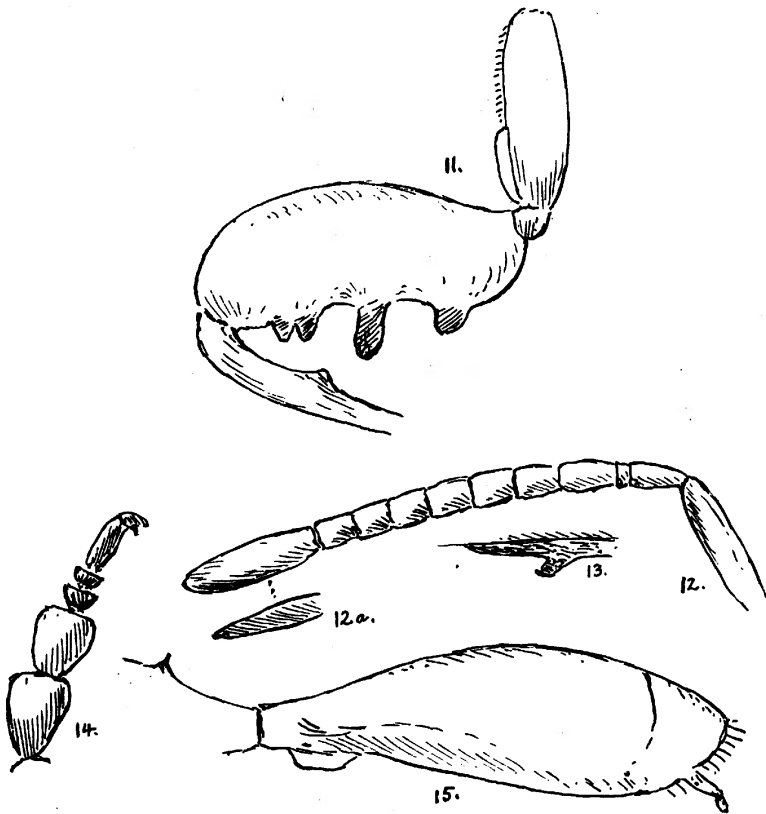
FEMALE (type).—Size and appearance nearly as in *P. dolichurum*, but easily distinguished by the following characters: face dull, not brilliant green; scape rufo-testaceous; funicle varying from very dark brown to red, but club black; apical funicular joints short, transverse; club conspicuously enlarged; hind femora distinctly metallic (green) only on outer side; ovipositor about 4 mm. long; venation brown.

Figs. 6 to 10. *Podagrion abbreviatum*.

6. Antenna of male. 7. Stigmatic region of male. 8. Stigmatic region of female. 9. Antenna of female. 10. Hind femur of female.

MALE.—Readily known from the male of *P. dolichurum* by the red antennæ, clear red anterior and middle legs, and the basal half of the abdomen dusky ferruginous. The antennal club is not swollen. The mandibles are short, black and tridentate. This sexual difference in the antennæ occurs also in the Australian *P. beneficium* Girault, and it seems very doubtful whether we should recognize the genus *Pachystomoidella* Girault, to which *Podagrion abbreviatum* might well be referred on account of the female antennæ.

Many females, and two males.



Figs. 11 to 15. *Pachytomus risbeci*. Males.

11. Hind coxa, femur, and part of tibia. 12. Antenna. 12a. View of club from side, showing compression. 13. Stigmatic region. 14. Hind tarsus. 15. Abdomen.

PACHYTOMUS Westwood

***Pachytomus risbeci*, new species**

MALE.—Head and thorax about 1.5 mm., abdomen about 1 mm.; hind coxæ about as long as abdomen; length of insect to end of hind femora fully 3.5 mm.; head and thorax yellowish green, the face brighter, emerald-green, vertex dull and

dark, thorax above dull olive-green, but scutellum brassy, and metathorax above with a bright brassy color; the middle of mesothorax is also somewhat brassy; sides of thorax bright green; antennæ rufotestaceous; wings hyaline, iridescent, the venation dark; legs rufotestaceous, hind coxæ with a large green patch on basal half externally; teeth on hind femora black; hind tibiæ very dark brown, red at extreme base and the broadened apical portion reddened; hind tarsi dusky reddish; abdomen rufotestaceous, shining green apically. Sculpture, and very sparse silvery hairs, quite ordinary; scutellum with posterior channel having large shining pits, and just above this a shining brassy pointed space; disc of scutellum finely reticulated, the reticulations more or less transverse; metathorax at each side with a small sharp spine, visible in profile; antennæ appearing 11-jointed, the club solid; ring-joint present; funicular joints fairly long, not transverse, each about $80\ \mu$ long; club about $240\ \mu$ long, not swollen, but compressed, so that in one view it appears very slender and acute; stigmal vein short and obtuse; abdomen with a short raised keel beneath near base; hind coxæ dorsally on basal half or rather more with short hairs, but on the apical portion a raised thin keel; hind femora enlarged as usual, with four teeth below, the first two very stout, the last two smaller and united; hind tibiæ with an angular projection on flexor surface; hind tarsi with first two joints very large, inclined to be quadrate, the next two small and transverse, the last elongate.

Three males.

The type of *Pachytomus* (*P. klugianus* Westwood) is from Egypt, and differs in the venation and tarsi to some extent. Possibly the New Caledonia species should form a distinct genus, but for the present it seems best to refer it to *Pachytomus*. The eyes of our species have a few very minute short hairs.

